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Editorial: Carbon emission governance in the evolution process of urban-rural interaction

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Editorial on the Research Topic

Carbon emission governance in the evolution process of urban-rural interaction

Welcome to this Research Topic in *Frontiers in Environmental Science*, which delves into the governance of carbon emissions within the context of urban-rural interaction. Urban-rural interaction is a dynamic process that shapes the socio-economic landscape of our regions. It is a critical factor in determining the quality of life, economic prosperity, and environmental sustainability. As we navigate through the 21st century, the challenge of carbon emission governance has emerged as a pivotal concern in this interaction. This Research Topic aims to explore the importance of managing carbon emissions and related environmental issues within the evolving urban-rural dynamics and propose strategies for carbon emission reduction and sustainable development. Four papers are published in this Research Topic with contributions from 15 authors. Here, we provide a succinct overview and key takeaways from each of these papers, as summarized below.

The first paper, titled “*Compliance relationship analysis between environmental governance attention and environmental quality in the Beijing–Tianjin–Hebei region*,” delves into the correlation between the focus on environmental governance and the actual state of environmental quality. By employing the text analysis method as well as the smooth transition regression (STR) model, the authors objectively present the shifts and distribution patterns of environmental governance attention within the Beijing–Tianjin–Hebei region. They further dissect the compliance relation between environmental governance attention and environmental quality. This study underscores the importance of government attention in promoting sustainable development at a regional scale (Wang et al.).

The second paper, “*Regional disparities, dynamic evolution, and spatial spillover effects of urban-rural carbon emission inequality in China*,” zeroes in on the topic of urban-rural emission inequality. By applying the Intergovernmental Panel on Climate Change (IPCC) methodology, this paper measures the carbon emissions of urban and rural residents in each province of China. Besides, this article not only tracks the evolving patterns of carbon emissions from urban and rural areas but also probes into the spatial spillover effects centered around the disparities in urban-rural carbon emissions. The study reveals a distinct

developmental trajectory for urban-rural carbon emissions, providing valuable insights for reducing inequality in urban-rural carbon emissions (Wei et al.).

Shifting the research sample to Shandong Province, the third paper, “*Inequality of carbon emissions between urban and rural residents in China and emission reduction strategies: evidence from Shandong Province*,” which also focuses on urban-rural carbon emission inequality, offers an in-depth examination of the carbon emission linked to the consumption habits of residents in both urban and rural settings, through the input-output method. It compares and analyzes the differences of the carbon footprints of urban-rural residents in Shandong Province. This study furnishes well-considered policy suggestions aimed at emission reduction for the Chinese government (Wang et al.).

Finally, the fourth paper, “*Decomposition, decoupling and dynamic prediction of carbon emissions from city-level building operations: a case study of the Yangtze River Delta*,” focusing on reducing carbon emissions in the building sector, investigates the evolution of carbon emissions from building operations across the Yangtze River Delta region, analyzing the spatial-temporal patterns over the past 15 years. Besides, it explores the determinants propelling carbon emissions in urban building operations and evaluates their decoupling trends. It projects the timing and magnitude of a potential carbon emissions peak. This research contributes to the formulation of informed and rational strategies for reducing carbon emissions from buildings within a complex, multi-tiered governance structure (Wang).

Collectively, these four papers provide a comprehensive exploration of managing carbon emissions and related environmental issues within the evolving urban-rural dynamics. By uncovering the relationship between environmental governance attention and environmental quality, urban-rural carbon emission inequality, spatial-temporal trends and decoupling status of carbon emissions, these articles provide significant contributions to the academic community and offer practical guidance for policy development.

As editors of this Research Topic, we aspire for the research published here to ignite additional exploration and catalyze collaborative initiatives focused on mitigating regional carbon emissions. By cultivating a cross-disciplinary conversation and sharing of expertise, we aim to collectively tackle the intricacies of carbon emission management. This collective effort is intended to lay the groundwork for a future that is both environmentally sustainable and socially just for everyone.

We express our heartfelt appreciation to the 15 contributing authors for their intellectual endeavors, to the reviewers for their

perceptive critiques, and to our readers for their ongoing interest in this pivotal Research Topic. In unity, let's set forth on a quest for a world that is both ecologically sound and economically thriving.

Author contributions

KD: Writing–original draft, Writing–review and editing. HL: Writing–review and editing. GW: Writing–review and editing. DZ: Writing–review and editing.

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